50X1-HUM

CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT

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COUNTRY	USSR (Leningrad Oblast)	REPORT	
SUBJECT	Svetlana Radio Tube Factory, Leningrad	DATE DISTR.	18 February 1954
		NO. OF PAGES	9
DATE OF INFO.		REQUIREMENT NO.	RD 50X1-HUM
PLACE ACQUIRED		REFERENCES	50X1-HUM

THE SOURCE EVALUATIONS IN THIS REPORT ARE DEFINITIVE.
THE APPRAISAL OF CONTENT IS TENTATIVE.
(FOR KEY SEE REVERSE)

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1. On the night of 21/22 October 1946, many German electronics specialists were deported by the Soviets from East Germany to the USSR. Among them were a number from the Oberspreewerke (OSW) in East Berlin (Berlin-Oberschöneweide, Ostendstrasse 1-5). Some of these OSW men went to work in the Svetlana Radio Tube Factory in Leningrad.

2. The Germans considered the 10 mw transmitter tube project the most important task given to them by the Soviet management between 1946 and the end of 1950. Some details of it were recorded in file notes for the German group made by Dr. Gross, who was then head of the group. 50X1-HUM

1) New task for the German group

The group was given the following task:

A tube with the following provisional characteristics is to be developed:

Wave length:	0.70 - 1.00 meter
Pulse power:	10,000 kw
Pulse frequency:	400 - 1,000 cycles
Pulse width:	1 - 2 µ sec
Cooling:	Water or air: air preferred.

For U_a 30,000 V was suggested: also built-in circuit and push-pull tube. Stakhorskiy will give us some details of a 150 kW American tube.

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STATE	x	ARMY	x	NAVY	x	AIR	x	FBI		AEC		OSI Ev	x		

2) Report on the new task

The group should try to prepare a short report on the results of their first considerations of this new task by 14 March 1947.

3) Procurement of foreign periodicals

A list of surnames is to be submitted for the procurement of periodicals.

4) Photocopying

If the needed electronics processes cannot be procured in Svetlana, they will be obtained from other works and photocopied.

For Messrs. Oberländer, Kotowski, Felder, Wiedemann, and Überrück.

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Comment:

The Germans thought that this new task was the most important upon which they worked at Svetlana. The Soviets had an [redacted] tube, VT 99, in mind and intended to give the Germans data on this. In the meantime, they stated the provisional characteristics set out above. 50X1-HUM

On 24 March 1947, there was another meeting with the Soviets. 50X1-HUM

[redacted]

Stakhorskiy has not yet been able, because of illness, to deal with the report.

It was first determined that:-

(1) 1 - 2 µ sec are the limits within which the pulse width should lie.

(2) 0.70 - 1 meter are similar limits - a fixed frequency (no variation) is needed.

(3) Cathodes to be oxide cathodes.

(4) Tube can be a single or push-pull tube.

(5) The keying ratio (Tastverhältnis) should be 1: 2000 as suggested.

(6) Cooling agent should if possible be air.

(7) Stakhorskiy will try to get the customer to decrease the power to 5 kw and then eventually have two tubes working in push-pull.

Comment:

The Germans continued to work on the task and the next day, 25 March 1947, it was agreed that the Germans' specifications would be accepted. The Germans had had to work entirely by themselves, as the promised data on the [redacted] VT-99 never appeared. 50X1-HUM

[redacted]

(1)	Power:	1,250 kw
(2)	Wave length:	1.4 m (fixed)
(3)	Anode potential:	max. 40,000 v.
(4)	Pulse width:	10 μ sec.
(5)	Frequency:	200 cycles
(6)	Cathode:	thorium or oxide (sic)

Two tubes as generators will be switched together in a push-pull circuit. This will give 2,500 kw for the transmitter.

There is an [redacted] tube, VT-99, which can give 150 kw at U_a = 27 kv with an oxide cathode.....

Comment: 50X1-HUM

These conditions having been accepted by the Soviets, the task, which was for some unknown ministry, was classified as TOP SECRET. The first designs were produced in May 1947. The first tube was ready a year later. It could not be properly used until summer 1949, by which time the necessary transmitter was available.

Twenty of these tubes were built up to December 1950; about half of them fulfilled the conditions laid down. 50X1-HUM

When the first tube was ready in 1948, it was taken over by the [redacted] Chief Engineer Zusmanovskiy, who came from Moscow for it. He belonged to an institute in Semashko[2] where an auxiliary transmitter apparently existed; with this the tube could be tested. The tube had the work number (Arbeitsnummer) G 1250.[3]

d. Description of the Tube (See sketch of the tube on page 9.)

1) As shown by the sketch, all connections were made concentric. A center pin led to the filament, the following pin led to both filament and cathode, and the third pin led to the grid and, in the opposite direction, to the anode. In the transmitter tank circuit which was to be built, the anode was connected at the grid side, so that combined air and water cooling was possible directly at the anode flange. The pump stub, under which the getter pills were located, was made of glass and also was on the anode side. Kovar was used for the glass-to-metal seal. Although Kovar was available, the glass itself had to be made at Svetlana. It was of the type designation TsS-8 (English transliteration) and corresponded roughly to hard glass of Osram, No. 756. The metal-to-glass seal and the spot welding were done with the help of a 10-kw rf transmitter which was available in the laboratory. By means of Lecher wires, this rf power was fed along the ceiling to four test desks. The required variations in output were obtained, not by controlling the anode voltage, but instead by a Variak (sic), which actually functioned as a variometer in the output circuit.

2) A voltage of 26 volts was required for the filament. The tungsten filament wires were wound in eight spiral turns, 0.2 mm in diameter, to a height of 50 mm inside of the eight cathode cylinders. The latter were made of nickel, approximately 10 x 3 mm in cross-section, and were coated on the outside with ordinary emission paste. The emission surface was 8 x 3.5 cm^2 and the emission was 6 w/cm^2.

3) The grid was wound with 0.1 mm Mo wire (pitch of 0.7) on a copper frame 50 mm in diameter. The frame was cut and milled from a solid piece. There were special hollows in the vertical supports through which the silver solder which fastened the grid wires could flow. Special notching permitted exact winding of the grid wires. The cathode-to-grid distance was 0.5 mm and the grid-to-anode distance was 2.3 mm.

4) The anode had an inside diameter of 54 mm and an outer one of 70 mm. The outside envelope had a diameter of 108 mm. Semi-circular hollows were made on the inside of the anode opposite the gaps between the emission layers in order to reduce internal capacitance. The tube was assembled in two separate operations, with the anode-glass envelope as one sub-assembly and the grid and cathode as the other. SECRET/CONTROL--US OFFICIALS ONLY

5) Before the welding, an ionization manometer was used to determine a 10^{-16} mm (sic) Hg vacuum. The getter pills were FeBa.

3. German personalities

a. In 1947 the Germans working in Svetlana were the following. The information is arranged thus in each case:

[redacted] 50X1-HUM

Felber, Herbert

[redacted] 50X1-HUM

2) Designer. [redacted]

[redacted]

Gross, Carl. Dr.

[redacted] 50X1-HUM

Oberländer, Hermann

[redacted] Electrical engineer 50X1-HUM

Sittel, Alfred

[redacted] 50X1-HUM

Stahn, Rudolf

[redacted] 50X1-HUM

" "
Überruck, Karl. Dipl. Ing.

[redacted] 50X1-HUM

Wiedemann, Walter

[redacted] 50X1-HUM

Kotowski, Hans. Dipl. Ing.

[redacted] 50X1-HUM

Zimmermann, Fritz

[redacted] 50X1-HUM

b. Lawyers appointed by the Germans

1) Wiedemann: Georg Krüger. [redacted] 50X1-HUM

2) The rest: Rechtsanwalt Dr. Landerath, [redacted] 50X1-HUM

This applies only to those mentioned in paragraph 3a.

c. Other German personalities

Beside those mentioned in paragraph 3a, Dr. Gross[redacted] Dr. Ammon, [redacted] and Herr Zinke. 50X1-HUM

4. Plans of the Svetlana Radio Tube Factory

The attached plans (pages 7 and 8) were sketched [redacted] of the Svetlana Radio Tube Factory. 50X1-HUM The sketch on page 7 shows the factory in relation to other objects. The scale may be judged from the fact that the Udelnaya and Lanskaya railroad stations shown are about three kilometers apart. The railroad sidings into the factory are also shown, as is the main street, Engels Prospekt, with the streetcar line which has its terminus at the entrance to the factory.

The other sketch (page 8) shows the individual buildings. The scale may be judged from the fact that the distance from the Engels Prospekt to the plant entrance was about 200 meters.

Legend to Sketch on Page 8.

1. Reception: Visitors were received here during working hours, their personal particulars determined, and an escort arranged.

2. Guard: The MVD staff of Major Grechov, political director of the works, had their offices here. The major himself had a room here, although he was normally in building 4.

3. Guard-house: Permanently manned by armed guards.

4. Administration: Stone, three-story building. Plant director Zakharov and Grechov had their rooms on the first floor. Major Grechov's room is heavily shaded on the plan. There was also a canteen room of some sort in the building.

5. Workshops: About 100 meters long. Heavy machinery, punches, and installations for tool and machine construction.

6. Laboratory: Three stories. Tube and apparatus development laboratories. The heavily shaded room, on the ground floor, was a large transformer installation, with large rectifiers and current suppliers for the whole building. Departments OKB and MGL were in this building, (OKB = Opytnoye Konstruktorskoye Byuro. MGL= Moshchnaya Generatornaya Lampa.)

7. Apprentices' home: Red brick building, four stories. Housed German PW's until spring 1948. Then fitted out for apprentices.

8. Glass-works: Partly two-story.

9. Tube factory: Five stories. Used since 1949 for the assembly of radio tubes, klystrons, and small transmitter tubes. On the ground floor there were [redacted] welding machines for metal tubes (Stahlröhren). 50X1-HUM

10. Workshop: Two stories. Ground floor: production of large transmitter tubes. First floor: electric workshops and X-ray tube production.

11. Large workshop: Two stories in front, otherwise one-storied. Production of transmitter tubes up to 10 kw, gas-filled rectifiers, P50 tubes, and grid-controlled rectifiers.

12. Production: Three-storied, red brick building. Construction of small transmitter tubes and production of radio tubes and pumps.

13. Ceramic shop: A long, low shop for the production of all necessary ceramics and pastes and for cathode-spraying.

14. Loot store: (Trofeynyy Sklad): Much looted German apparatus was lying, cased and uncased, in this store and outside it. Much of it had deteriorated through exposure to the weather. The store was cleared in 1950 and it was then to be turned into a production shop.

15. Loading ramps

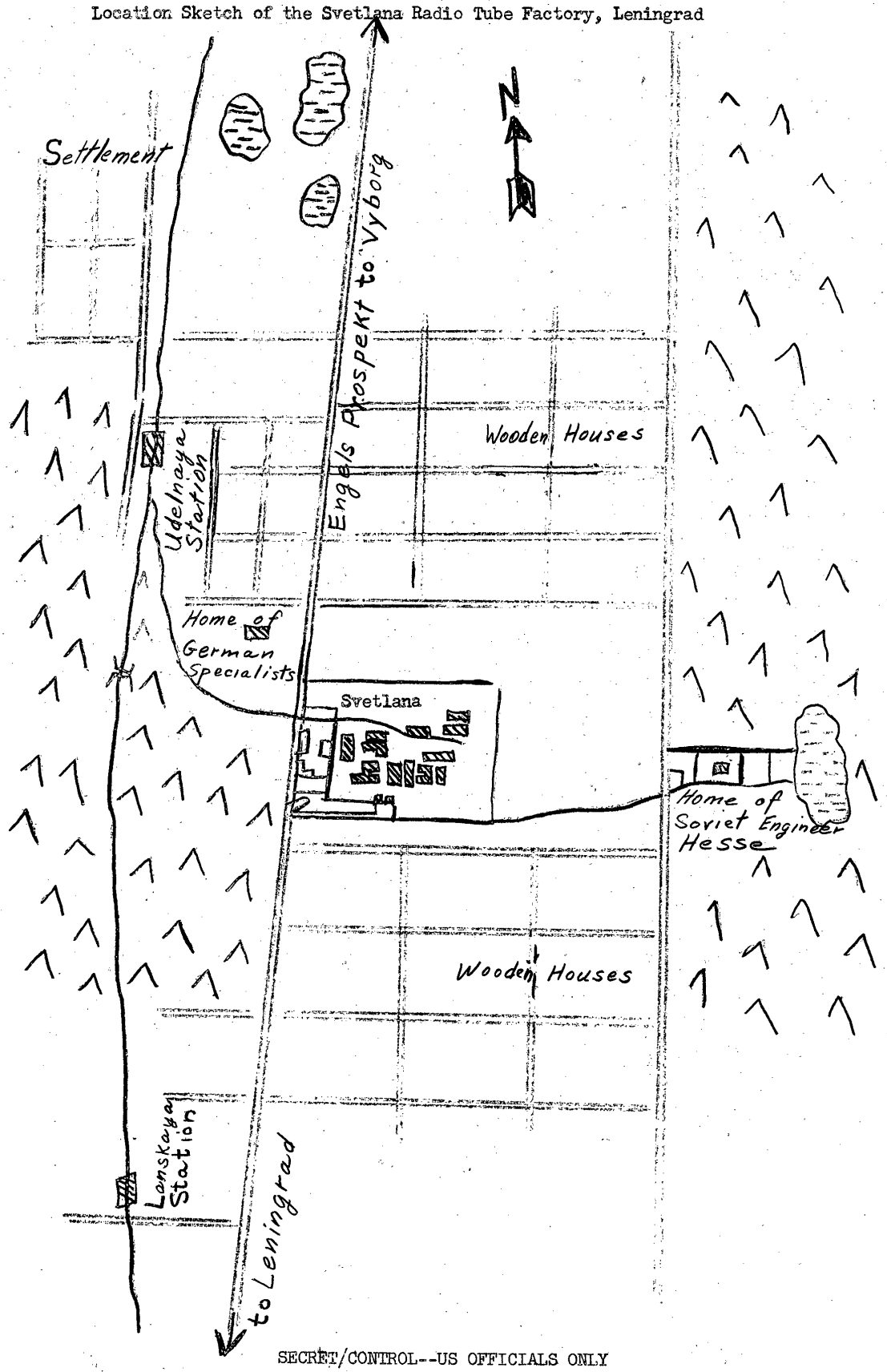
16. Orlova Club-house: The Germans lived here.

1. [redacted] Comment. This name was also [redacted] Stakhovskiy.

2. [redacted] Comment. The location of Semashko cannot be determined. [redacted] 50X1-HUM
It suggests that Semashko may 50X1-HUM
be Sanatoriya Semashko which is located in Shchelkovo near Moscow. The Zusmanovskiy mentioned here is possibly the Zusmanovskiy frequently reported at Institute 160, Fryazino.

3. [redacted] Comment. This designation was also given as GI 250. 50X1-HUM

Location Sketch of the Svetlana Radio Tube Factory, Leningrad



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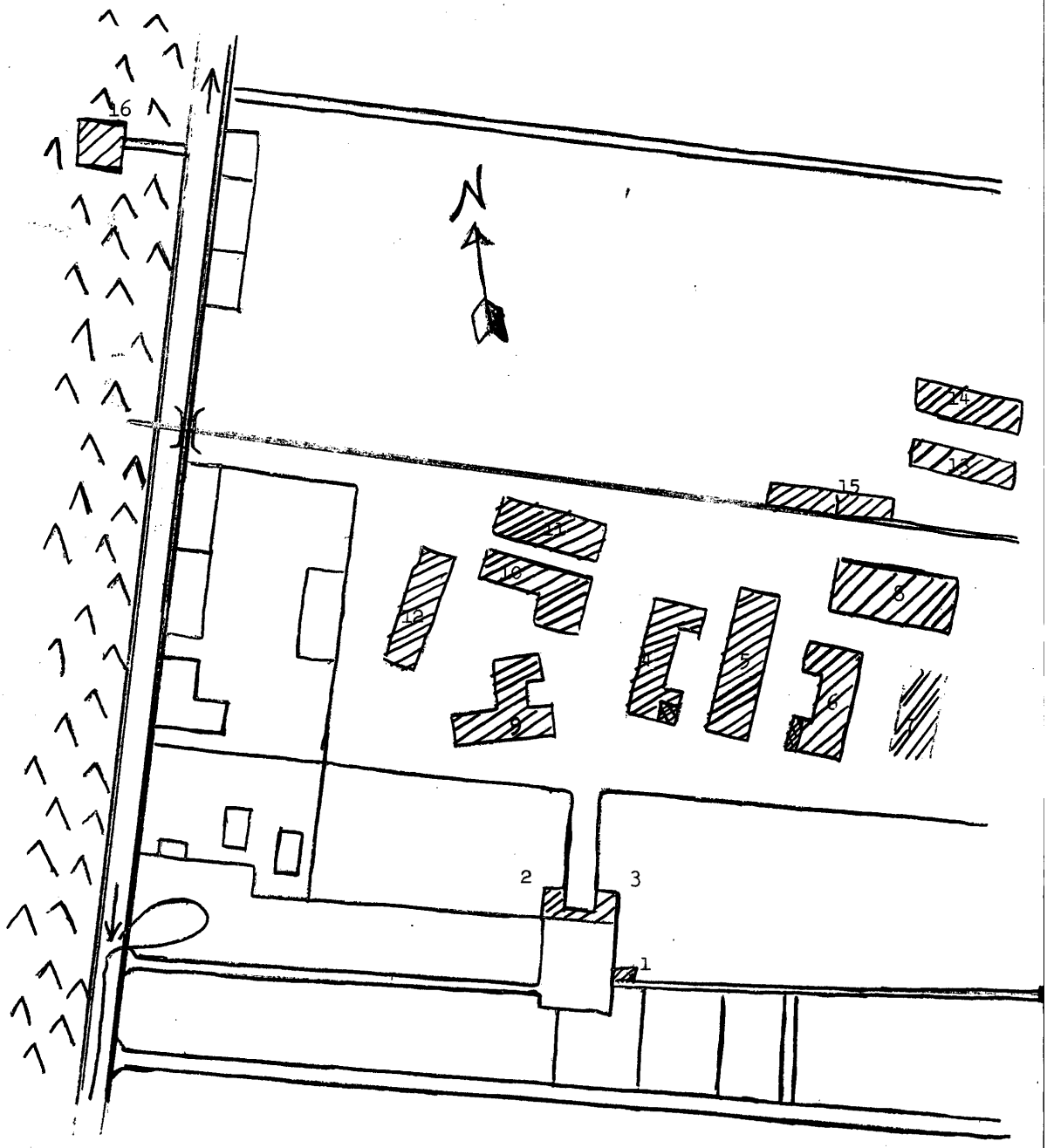
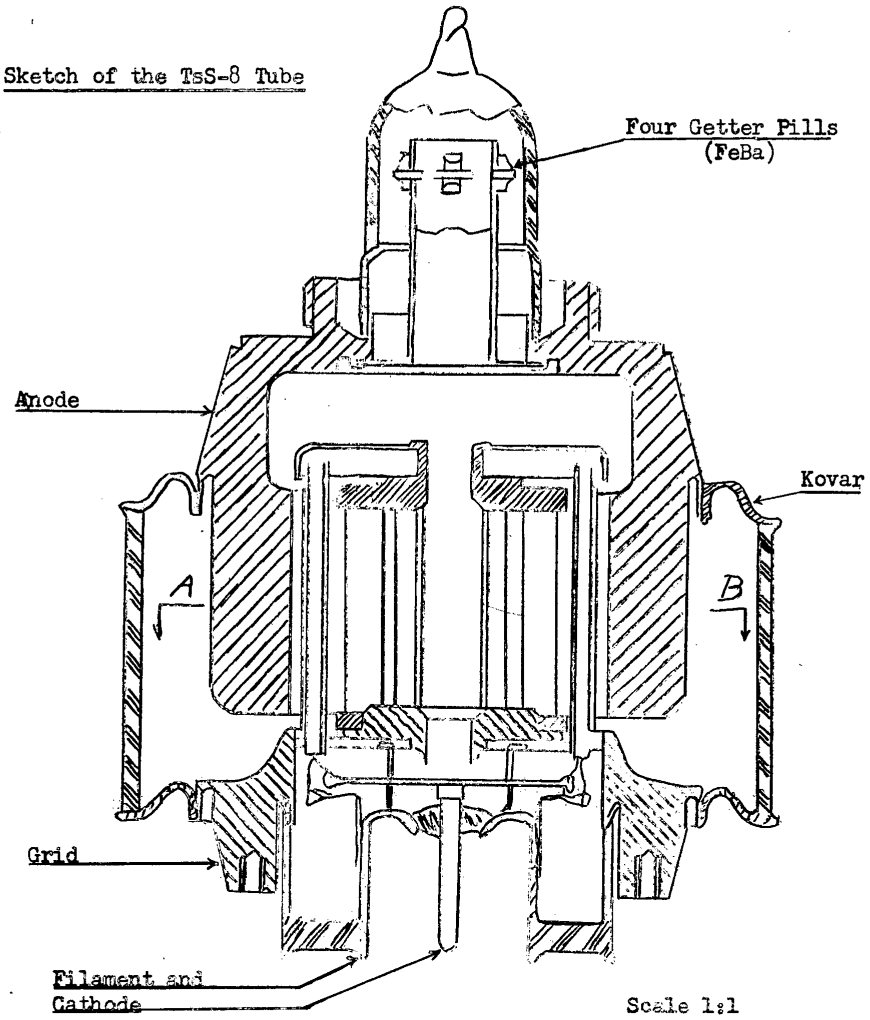
Layout Sketch as of 1950



Sketch of the TsS-8 Tube



Scale 1:1

Cross Section of A and B